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## Mollusca of the Laverne Formation (Lower Pliocene) of Beaver County, Oklahoma

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**ABSTRACT:** The molluscan fauna of the Laverne formation, lower Pliocene, is described. The mollusks as now known comprise 24 species belonging to 15 genera and 10 families. Eleven of the species are described as new: Amnicolidae—*Calipyrgula hibbardi*, *C. turricula*, *C. tumida*, *C. scuta*; Lymnaeidae—*Lymnaea laverneensis*; Planorbidae—*Helisoma valens*, *H. goodrichi*, *H. parallelum*; Ancyliidae—*Ferrissia depressus*, *F. angustus*; Pupillidae—*Gastrocopta antevades*. The literature concerning the formation is reviewed. The geology and the problem of the physical conditions prevailing during the deposition of the fossiliferous strata are discussed.

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### INTRODUCTION

THE name Laverne formation was first applied to sediments exposed in Harper and Beaver counties, Oklahoma, by V. V. Waite in an unpublished manuscript quoted by Gould and Lonsdale (1926). Chaney and Elias (1936) studied the fossil plants of this formation in Beaver county, and proving to their own satisfaction that they were post-Miocene in age, referred to these beds as lower Pliocene deposits, but did not clarify their relationship to the Ogallala formation. Hesse (Chaney and Elias, 1936, pp. 47-51) reviewed the literature on the Laverne, and after studying the vertebrate fauna, classified these deposits as a zone in the Ogallala formation. Smith (1940) recognized the presence of rocks which unconformably underlie typical Ogallala beds along the Cimarron river valley in Seward county, Kansas. Frye and Hibbard (1941) described these rocks in Meade and Seward counties, Kansas, and correlated them with the Laverne formation of Oklahoma. The Laverne formation was regarded by them as a distinct formation,